

- NOC *resolves*
- MOD 1. that, pending the entry into force of a permanent procedure, the use of frequency assignments by:
- MOD a) non-geostationary-satellite systems in the space services in relation to other non-geostationary-satellite systems, geostationary-satellite systems and terrestrial stations;
- NOC b) geostationary-satellite systems in relation to non-geostationary-satellite systems; and
- MOD c) terrestrial stations in relation to the earth stations of non-geostationary-satellite networks;
- MOD to which this Resolution applies shall be regulated in accordance with the interim procedures and the associated provisions and criteria contained in Annexes 1 and 2 respectively;
- MOD 2. that the interim procedures annexed to this Resolution apply in addition to those of Articles 11 and 13 for geostationary-satellite networks and shall replace those of Articles 11 and 13 for non-geostationary-satellite networks in those frequency bands specifically identified by footnote to the Table of Frequency Allocations in Article 8;
- MOD 3. that the interim procedures annexed to this Resolution shall be applied from 17 November 1995;
- NOC *invites*
- NOC 1. all administrations concerned in or by the introduction and operation of non-geostationary-satellite systems in the relevant space services to cooperate in the application of these interim procedures;
- MOD 2. all administrations which acquire experience in the application of the annexed interim procedures to contribute to the studies of the ITU-R;
- MOD *instructs the Radiocommunication Bureau*
- NOC to apply these procedures and to provide the necessary assistance to administrations;
- MOD *invites the ITU-R Study Groups*
- NOC to study and develop Recommendations on the coordination methods, the necessary orbital data relating to non-geostationary-satellite systems, and the sharing criteria;

ANNEX 1 TO RESOLUTION No. 46(REV.WRC-95)

MOD **Interim Procedures for the Coordination and Notification of Frequency
Assignments of Satellite Networks in Certain Space Services
and the Other Services to Which Certain Bands
are Allocated**

Section A. General Information

MOD A.1 The assistance of the Radiocommunication Bureau can be requested in the application of the provisions of this annex.

MOD A.2 In the absence of specific provisions relating to the evaluation of the interference, the calculation methods and the criteria should be based on relevant ITU-R Recommendations agreed by the administrations concerned, either as a result of Resolution 703 (Rev.WARC-92) or otherwise. In the event of disagreement on a ITU-R Recommendation or in the absence of such Recommendations, the methods and criteria shall be agreed between the administrations concerned. Such agreements shall be concluded without prejudice to other administrations.

MOD **A.3** When applying the provisions of this Resolution for non-geostationary-satellite networks, administrations shall provide the following information in addition to that of Appendix 3 or Appendix 4:

- | | | |
|------------|------|---|
| ADD | i) | Orientation of the satellite transmitting and receiving antenna beams and their radiation pattern. |
| ADD | ii) | Type of modulation and multiple access and spectrum mask. |
| ADD | iii) | Appropriate information required to calculate the region affected by the MSS space stations as defined in Recommendation ITU-R M.1187. |
| ADD | iv) | Maximum and average peak e.i.r.p./4 kHz and e.i.r.p./1 MHz for each beam. |
| ADD | v) | Satellite antenna gain $G(\Theta_e)$ as a function of elevation angle at a fixed point on the Earth. (To be provided either as part of Appendix 3 or as a formula to convert existing Appendix 3 data.) |
| ADD | vi) | Spreading loss (for a non-GSO satellite) as a function of elevation angle. (To be determined by equations or provided in graphical form.) |

MOD

vii) New data elements required to properly characterize non-GSO satellite systems:

N_p = Number of orbital planes

N_s = Number of satellites in each orbital plane

Ω_j = Right ascension of the ascending node for the j -th orbital plane, measured counter-clockwise in the equatorial plane from the direction of the vernal equinox to the point where the satellite makes its south-to-north crossing of the equatorial plane ($0^\circ \leq \Omega_j < 360^\circ$).

i_j = Inclination angle for the j -th orbital plane with respect to the reference plane, which is taken to be the Earth's equatorial plane ($0^\circ \leq i_j < 180^\circ$).

ω_i = Initial phase angle of the i -th satellite in its orbital plane at reference time $t=0$, measured from the point of ascending node ($0^\circ \leq \omega_i < 360^\circ$).

a = Semi-major axis.

e = Eccentricity ($0 \leq e \leq 1$)

ω_p = Argument of perigee, measured in the orbital plane, in the direction of motion, from the ascending node to perigee ($0^\circ \leq \omega_p < 360^\circ$)

ADD

In the following, references to Appendix 3 or Appendix 4 information shall be considered to include this additional information, where appropriate.

NOC

Section I. Procedures for the Advance Publication of Information on Planned Satellite Networks

NOC

Publication of Information

MOD

1.1 An administration (or one acting on behalf of a group of named administrations) which intends to bring into use a satellite network within a satellite system shall, prior to the coordination procedure described in paragraphs 2.1 and 2.2, send to the Bureau, not earlier than six years¹ and preferably not later than two years before the date of bringing into service of each satellite network, the information listed in Appendix 4.

MOD

¹ See also paragraph 5.1.6.

- MOD** 1.2 Amendments to the information sent in accordance with the provisions of paragraph 1.1 shall also be sent to the Bureau as soon as they become available. For geostationary-satellite networks and non-geostationary-satellite networks which are subject to Section II, the use of an additional frequency band will require the application of the advance publication procedure for this band. For non-geostationary-satellite networks which are not subject to Section II, the use of an additional frequency band or an extension of the service area will require the application or recommencing respectively of the advance publication procedures for these modifications, see Resolution COM4-6.
- MOD** 1.3 On receipt of the complete information sent under paragraphs 1.1 and 1.2, the Bureau shall publish it in a special section of its weekly circular within three months and shall also, when the weekly circular contains such information, so advise all administrations by circular telegram. The circular telegram shall indicate the frequency bands to be used and, in the case of a geostationary satellite, the orbital location of the space station. When the Bureau is not in a position to comply with the time limit referred to above, it shall periodically so inform the administrations, giving the reasons therefor.
- NOC** *Comments on Published Information*
- MOD** 1.4 If, after studying the information published under paragraph 1.3, any administration is of the opinion that interference which may be unacceptable may be caused to assignments of its existing or planned satellite networks or to assignments to its existing or planned terrestrial stations, it shall, within four months after the date of the weekly circular referred to in paragraph 1.3 above, send the administration concerned its comments on the particulars of the interference to its existing or planned satellite networks or to its existing or planned terrestrial stations. A copy of these comments shall also be sent to the Bureau. If no such comments are received from an administration within the period mentioned above, it may be assumed that the administration has no basic objections to the planned satellite network(s) of the system on which details have been published.
- NOC** 1.4A An administration sending information under paragraphs 1.1 and 1.2 shall, if requested by an administration receiving information published under paragraph 1.3, provide the technical methods and criteria it proposes to use for the evaluation of the interference.
- NOC** 1.4B An administration receiving information published under paragraph 1.3, may provide to the administration sending information under paragraphs 1.1 and 1.2 the technical methods and criteria it proposes to use for the evaluation of the interference.

NOC *Resolution of Difficulties*

NOC 1.5 An administration receiving comments sent in accordance with paragraph 1.4 and administrations sending such comments shall endeavour to resolve any difficulties that may arise and shall provide any additional information that may be available.

NOC 1.5A In case of difficulties arising, the administration responsible for the planned network shall first explore all possible means of meeting its requirements without considering the possibility of adjustment to stations or networks of other administrations. If no such means can be found, the administration concerned may then request other administrations, either bilaterally or multilaterally, to mutually help resolve these difficulties.

NOC 1.5B An administration receiving a request under paragraph 1.5A shall, in consultation with the requesting administration, explore all possible means of meeting the latter's requirements.

NOC 1.5C If, after following the procedure described in paragraphs 1.5A and 1.5B, there are unresolved difficulties, the administrations concerned shall jointly make every possible effort to resolve these difficulties by means of mutually acceptable adjustments.

NOC *Results of Advance Publication*

MOD 1.6 An administration on behalf of which details of planned satellite networks have been published in accordance with the provisions of paragraphs 1.1 to 1.3 shall, after the period of four months specified in paragraph 1.4, inform the Bureau whether or not comments provided for in paragraph 1.4 have been received and of the progress made in resolving any difficulties. Additional information on the progress made in resolving any remaining difficulties shall be sent to the Bureau at intervals not exceeding six months prior to the commencement of coordination or notification to the Bureau, as the case may be. The Bureau shall publish this information in the special section of its weekly circular.

MOD 1.7 When, upon expiry of a period of six years plus the extension provided for in paragraph 5.1.6 after the date of the publication of the special section referred to in paragraph 1.3, the administration responsible for the network has not submitted the Appendix 3 information, for coordination under paragraph 2.1 or paragraph 2.2 or notification under No. 1488 of the Radio Regulations or Section V of this Annex, as appropriate, the information published under paragraph 1.3 shall be cancelled after the administration concerned has been informed.

NOC *Commencement of Coordination or Notification Procedures*

MOD 1.8 When communicating to the Bureau the information referred to in paragraph 1.1, an administration may, at the same time or later, communicate:

NOC 1.8A the information required for the network coordination of a frequency assignment to a station of a satellite network in accordance with the provisions of paragraph 2.6, or

NOC 1.8B the information required for notification of a frequency assignment to a station of a satellite network when coordination for that assignment is not required.

MOD 1.9 The coordination or notification information, as the case may be, shall be considered as having been received by the Bureau not earlier than six months after the date of receipt of the complete information as indicated under paragraph 1.3.

NOC **Section II. Coordination of Frequency Assignments to a Station of a Satellite Network**

NOC *Requirement for Coordination*

MOD 2.1 Before an administration (or one acting on behalf of one or more named administrations)¹ notifies to the Bureau or brings into use any frequency assignment to a space station or to an earth station of a non-geostationary-satellite network, it shall effect coordination of the assignment with any other administration:

MOD - whose assignment to a station in a geostationary-satellite network might affect or be affected by the proposed assignment, or

MOD - whose assignment to a station of a non-geostationary-satellite network might affect or be affected by the proposed assignment, or

MOD - whose assignment to a terrestrial station might affect or be affected by the proposed space station assignment.

- MOD** 2.2 Before an administration (or one acting on behalf of one or more named administrations)¹ notifies to the Bureau or brings into use any frequency assignment to a station of a geostationary-satellite network, it shall effect coordination of the assignment with any other administration:
- MOD** – whose assignment to a station of a non-geostationary-satellite network might affect or be affected by the proposed assignment, or
- MOD** – whose assignment to a terrestrial station might affect or be affected by the proposed space station assignment.
- NOC** 2.3 Coordination under paragraphs 2.1 and 2.2 may be effected for a satellite network using the information relating to the space station, including its service area, and the parameters of one or more typical earth stations which may be located in all or part of the space station service area.
- MOD** 2.4 If a frequency assignment is brought into use before the commencement of the coordination procedure of paragraphs 2.1 and 2.2, when this coordination is required, the operation in advance of the receipt by the Bureau of the Appendix 3 information shall in no way afford any priority of the date.
- ¹ Whenever, under this provision, an administration acts on behalf of a group of named administrations, all members of the group retain the right to respond in respect of their own networks or systems.
- 2.5 *Assignments to be taken into account*
- MOD** 2.5.1 Frequency assignments to be taken into account in the application of paragraphs 2.1 and 2.2 are those with a frequency overlap with the planned assignment, pertaining to the same service or to another service to which the band is allocated with equal rights, or a higher category of allocation (see Nos. 420 to 425 and 435), and which:
- MOD** for space services, are:
- 2.5.2 in conformity with No. 1503, and
- MOD** 2.5.3 either recorded in the Master Register, or notified to the Bureau without any coordination in those cases when the provisions of paragraph 2.5.8 apply, or coordinated under the provisions of this Section or of Section II of Article 11, or received by the Bureau prior to 18 November 1995 for notification in cases where coordination was not required as of the date of receipt of the notice, or

- MOD** 2.5.4 included in the coordination procedure with effect from the date of receipt by the Bureau, in accordance with paragraph 2.6 or No. 1074 or 1074A of Article 11, of the complete information as specified in Appendix 3;
- or, for terrestrial services, are:
- MOD** 2.5.5 recorded in the Master Register with a favourable finding with respect to No. 1240, or
- MOD** 2.5.6 not notified but in use or planned to be brought into use within the three years following the date of the publication referred to in paragraph 2.7.2.
- ADD** 2.5.7 Coordination of space services (space-to-Earth) with the terrestrial services of an administration is required only if the threshold levels appearing in Annex 2 of this Resolution are exceeded over any part of the territory of this administration.
- ADD** 2.5.8 No coordination under paragraphs 2.1 or 2.2 is required:
- ADD** a) when the characteristics of a new or a modified frequency assignment or a new earth station are within the limits of those of a frequency assignment which has previously been coordinated;
- ADD** b) when, for a new frequency assignment to a receiving station, the notifying administration states that it accepts the interference resulting from the frequency assignments referred to in paragraphs 2.5.1 to 2.5.4;
- ADD** c) between earth stations using frequency assignments in the same direction (either Earth-to-space or space-to-Earth).
- NOC** *Coordination Data*
- MOD** 2.6 The administration seeking coordination shall send to the Bureau the information listed in Appendix 3.
- MOD** 2.7 On receipt of the complete information referred to in paragraph 2.6, the Bureau shall:
- MOD** 2.7.1 examine this information with respect to its conformity with No. 1503; the date of its receipt shall be considered as the date from which the assignment will be taken into account for coordination, and

MOD 2.7.2 publish in the special section of its weekly circular, within three months, the information received under paragraph 2.6 and the result of the examination under paragraph 2.7.1. When the Bureau is not in a position to comply with the time limit referred to above, it shall periodically so inform the administrations giving the reasons therefor, and

ADD 2.7.3 to assist administrations in identifying services that might be affected, include in the special section mentioned in paragraph 2.7.2 the names of the administrations having frequency assignments complying with the provisions of paragraphs 2.5.1, 2.5.2, 2.5.3, 2.5.4 for space services and paragraphs 2.5.1 and 2.5.5 for terrestrial services.

NOC *Examination of Coordination Data and Agreement Between Administrations*

MOD 2.8 On receipt of the special section referred to in paragraph 2.7.2, an administration shall promptly examine the matter with regard to:

MOD 2.8.1 interference which would be caused to the frequency assignments of its satellite networks or by these assignments to the satellite network for which coordination is sought, or

ADD 2.8.2 its planned or existing terrestrial stations which have a frequency overlap with the frequency assignments of the space station for which coordination is sought.

MOD 2.9 In so doing, it shall have regard to the proposed date of bringing into use of the assignment for which coordination is sought. It shall then, within four months from the date of the relevant weekly circular, notify the administration seeking coordination of its agreement.

ADD 2.10 On receipt of the special section referred to in paragraph 2.7.2, and within the same four-month period, an administration in need of assistance may inform the Bureau that it has recorded, existing or planned terrestrial stations that might be affected by the planned satellite network and may request the Bureau to determine the need for coordination by applying the Annex 2 criteria. The Bureau shall inform the administration seeking coordination of this request, indicating the date by which it may be able to provide the results of its analysis. When these results are available, the Bureau shall inform both administrations.

- ADD** A request under paragraph 2.10 shall be considered as a disagreement, pending the results of the analysis by the Bureau of the need for coordination.
- MOD** 2.11 If an administration does not agree under paragraph 2.9 or has requested assistance from the Bureau under paragraph 2.10, it shall, within the same period, send to the administration seeking coordination the technical details of the networks or information on the terrestrial stations concerned upon which its disagreement is based, including:
- MOD** 2.11.1 in case of a disagreement under paragraph 2.8.1, the characteristics contained in Appendix 3, or
- MOD** 2.11.2 in case of a disagreement under paragraph 2.8.2, the characteristics contained in Section C of Appendix 1 which have not previously been notified to the Bureau,
- MOD** and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem. A copy of these comments shall also be sent to the Bureau.
- ADD** 2.12 If the administration concerned has notified its disagreement within the same period, but the information on the fixed service stations upon which its disagreement is based cannot be provided, it shall be assumed that reference parameters, as contained in Annex 2, can be used to determine the need for coordination with this administration.
- MOD** 2.13 Administrations with which coordination is sought, as well as the administration seeking coordination, shall make all possible mutual efforts to overcome the difficulties in a manner acceptable to the parties concerned.
- ADD** 2.14 Forty-five days prior to the expiry of the four-month period mentioned in paragraph 2.9, the Bureau shall dispatch a circular telegram to all administrations, bringing the matter to their attention.
- ADD** 2.15 Upon receipt of the circular telegram mentioned in paragraph 2.14, an administration shall acknowledge receipt immediately by telegram. If no acknowledgement is received within thirty days, the Bureau shall dispatch a telegram requesting acknowledgement, to which the receiving administration shall reply within a further period of fifteen days.

2.16 When an administration has not responded to the Bureau within the period of four months referred to in paragraph 2.9, it shall be deemed that this administration has undertaken:

- ADD a) that no complaint will be made in respect of any harmful interference affecting the services rendered by its satellite networks referred to in paragraphs 2.5.1 to 2.5.4 which may be caused by the use of the assignment to a station of the satellite network for which coordination was requested;
- ADD b) that no complaint will be made in respect of any harmful interference affecting the services rendered by its terrestrial stations referred to in paragraph 2.5.1, 2.5.5 and 2.5.6 which may be caused by the use of the assignment to a station of the satellite network for which coordination was requested;
- ADD c) that its assignments to a station in a satellite network referred to in paragraphs 2.5.1 to 2.5.4 will not cause harmful interference to the satellite network assignment for which coordination was requested;
- ADD d) that assignments to terrestrial stations referred to in paragraphs 2.5.1 and 2.5.6 will not cause harmful interference to the satellite network assignment for which coordination was requested.

NOC *Results of Coordination*

MOD 2.17 An administration which has initiated a coordination procedure under the provisions of paragraphs 2.1 to 2.6 shall communicate to the Bureau the names of the administrations with which agreement has been reached. The Bureau shall publish this information in the special section of its weekly circular.

MOD 2.18 An administration which has sought coordination, as well as any administration which has complied with the provisions of paragraphs 2.8 to 2.16, shall communicate to the Bureau any modifications to the published characteristics of their respective networks or stations that were required to reach agreement on the coordination. The Bureau shall publish this information in accordance with paragraph 2.7.2, indicating that these modifications resulted from the joint efforts of the administrations concerned to reach agreement on the coordination.

ADD

Requests to the Bureau for Assistance in Effecting Coordination

*S9.60 to
S9.65.1*

2.18.1

If an administration with which coordination is sought has disagreed under paragraph 2.11, but fails to give a decision on the matter or to provide information concerning its own assignments upon which the disagreement is based, within the same four-month period specified in paragraph 2.9, the requesting administration may seek the assistance of the Bureau.

2.18.2

The Bureau, acting on a request under paragraph 2.18.1, shall forthwith send a telegram to the administration concerned requesting it to give an early decision on the matter or to provide the relevant information.

2.18.3

If the administration concerned still does not respond to this request within thirty days of the Bureau's action under 2.18.2, the conclusions under paragraph 2.16 shall apply.

2.18.4

If there is continuing disagreement, or if any administration involved has requested the assistance of the Bureau, the Bureau shall seek any necessary information to enable it to assess the interference. It shall communicate its conclusions to the administrations involved.

NOC

Notification of Frequency Assignments in the Event of Continuing Disagreement

MOD

2.19 In the event of continuing disagreement between an administration seeking to effect coordination and any administration with which coordination has been sought, the administration seeking coordination shall, except in the cases where the assistance of the Bureau has been requested, defer the submission of its notice concerning the proposed assignment by six months from the date of publication of the special section referred to in paragraph 2.7.2, taking into account the provisions of No. 1496. When the assistance of the Bureau has been requested, the submission of the notice shall be deferred for a further three months.

MOD **Section III. Coordination of Frequency Assignments to Earth Stations
of a Non-Geostationary-Satellite Network in Relation to Terrestrial
Stations and of a Satellite Network in Relation to Other Earth
Stations in the Opposite Direction of Transmission**

NOC *Requirement for Coordination*

MOD 3.1 Before an administration notifies to the Bureau or brings into use any frequency assignment to a fixed earth station or to typical earth stations in a particular band allocated with equal rights to space and terrestrial radiocommunication services, it shall effect coordination of the assignment with each administration whose territory lies wholly or partly within the coordination area as specified in Annex 2 to this Resolution. The request for coordination may specify all or some of the frequency assignments to the associated space station, but thereafter each assignment shall be dealt with individually.

ADD 3.1.1

No coordination under paragraph 3.1 is required:

ADD 3.1.2

a) when an administration proposes to bring into use an earth station the coordination area of which does not include any of the territory of any other country;

ADD 3.1.3

b) when an administration proposes to bring into use an assignment to an earth station operating in the opposite direction of transmission, which is located in relation to an earth station outside the coordination area of that earth station;

ADD 3.1.4

c) when the characteristics of a new or modified assignment are within the limits of those of a frequency assignment which has previously been coordinated;

ADD 3.1.5

d) when an administration proposes to bring into use a new frequency assignment to a receiving earth station and the notifying administration states that it accepts the interference resulting from existing and future terrestrial station assignments or earth station assignments operating in the opposite direction of transmission. In such case, administrations responsible for the terrestrial stations or the earth stations, are not required to apply the provisions of Section IV or Section III respectively, of this Article.

NOC *Coordination Data*

MOD 3.2 For the purpose of effecting coordination, the administration requesting coordination shall send to each administration concerned under paragraph 3.1 all basic characteristics concerning the proposed frequency assignment as listed in Appendix 3, and an indication of the planned date of bringing into use.

NOC *Acknowledgement of Receipt of Coordination Data*

NOC 3.3 An administration with which coordination is sought under paragraph 3.1 shall immediately acknowledge receipt of the coordination data.

NOC *Examination of Coordination Data and Agreement Between Administrations*

NOC 3.4 On receipt of the coordination data, an administration shall, having regard to the proposed date of bringing into use of the assignment for which coordination was requested, promptly examine the matter with regard to both:

MOD 3.4.1 a) interference which would affect the service rendered by its terrestrial stations operating in accordance with the Constitution, the Convention and these Regulations, or to be so operated prior to the planned date of bringing into service of the earth station assignment, or within the next three years, whichever is the longer, and

ADD 3.4.1 b) interference which would affect the services rendered by its earth stations which are operating, or are planned to be operated in the opposite direction of transmission, prior to the planned date of bringing into service of the earth station assignment, or within the next three years, whichever is the longer. The assignments to be taken into account in this examination are those:

3.4.1.b1 for which the associated space network characteristics have been communicated to the Bureau under paragraph 1.3; and

3.4.1. b2 which are in conformity with No. 1503; and

3.4.1.b3 either coordinated under No. 1107 or paragraph 3.1 above; or

- 3.4.1.b4 to be taken into account for coordination with effect from the date of communication of the information referred to in No. 1113 or paragraph 3.2 above; or
- 3.4.1.b5 recorded in the Master Register with a favourable finding with respect to No. 1505 or paragraph 5.1.2 below; or
- 3.4.1.b6 recorded in the Master register with an unfavourable finding with respect to No. 1505 or paragraph 5.1.2 below, and a favourable finding with respect to No. 1509 or paragraph 5.1.4 below; or
- 3.4.1.b7 recorded in the Master Register in application of No. 1544, if that frequency assignment has not in fact caused harmful interference to any other previously recorded frequency assignment which is in conformity with No. 1503;

MOD

- 3.4.2 a) interference which would be caused to reception at an earth station by the service rendered by its terrestrial stations operating in accordance with the Constitution, the Convention and these Regulations, or to be so operated prior to the planned date of bringing into service of the earth station assignment, or within the next three years, whichever is the longer;

ADD

- 3.4.2 b) interference which would be caused to reception at an earth station by the service rendered by its earth stations in the opposite direction of transmission, covered under paragraphs 3.4.1.b1 to 3.4.1.b7, which are operating, or are to be operated prior to the planned date of bringing into service of the earth station assignment, or within the next three years, whichever is the longer.

NOC

- 3.5 The administration with which coordination is sought shall, within four months from dispatch of the coordination data:

MOD

- 3.5.1 notify the administration requesting coordination of its agreement with a copy to the Bureau, indicating, where appropriate, the part of the allocated frequency band containing the coordinated frequency assignments; or

ADD 3.5.2 send to that administration a request for inclusion in coordination of the terrestrial stations or the earth stations in the opposite direction of transmission mentioned in 3.4.1a), 3.4.1b), 3.4.2a) and 3.4.2b); or

MOD 3.5.3 notify that administration of its disagreement.

MOD 3.6 In the cases mentioned in paragraphs 3.5.2 and 3.5.3, the administration with which coordination is sought shall send to the administration requesting coordination a diagram drawn to an appropriate scale indicating the location of those terrestrial stations or earth stations in the opposite direction of transmission which are or will be within the coordination area, together with all other relevant basic characteristics using Appendix 1 or Appendix 3, as appropriate, and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem.

MOD 3.7 When the administration with which coordination is sought sends to the administration seeking coordination the information required in the case of paragraph 3.5.3, a copy thereof shall also be sent to the Bureau.

ADD a) The Bureau shall consider as notifications in accordance with Section I of Article 12 only that information relating to existing terrestrial stations, or to those to be brought into use within the next three months.

ADD b) The Bureau shall consider as notifications in accordance with Section I of Article 13 only that information relating to existing earth stations, or to those to be brought into use within the next three years.

ADD 3.7.1 When an agreement on coordination is reached as a consequence of paragraphs 3.5 to 3.7, the administration responsible for the terrestrial stations or the earth stations in the opposite direction of transmission may send to the Bureau the information concerning those stations covered by the agreement which are intended to be notified in accordance with Section I of Article 12 or Section I of Article 13, as appropriate. The Bureau shall consider as notifications in accordance with those Sections only that information relating to existing stations or to those to be brought into use within the next three years.

ADD 3.7.2 The periods referred to in paragraphs 3.4.1 and 3.4.2 may be extended by agreement between the administrations concerned in order to take planned terrestrial and space networks into account. Coordination between earth stations may commence five and a half years before bringing these stations into use.

ADD *Requests to the Bureau for Assistance in Effecting Coordination*

[RR 1130 to
1144]

ADD 3.7.3

ADD An administration seeking coordination may request the Bureau to endeavour to effect coordination in those cases where:

ADD 3.7.4

ADD a) an administration with which coordination is sought under paragraph 3.1 fails to acknowledge receipt, under paragraph 3.3, within forty-five days of dispatch of the coordination data referred to in paragraph 3.2; or

ADD 3.7.5

ADD b) an administration has acknowledged receipt under paragraph 3.3, but fails to give a decision within four months from dispatch of the coordination data under paragraph 3.2; or

ADD 3.7.6

ADD c) there is disagreement, as to the acceptable interference, between the administration seeking coordination and an administration with which coordination is sought; or

ADD 3.7.7

ADD d) coordination is not possible for any other reason.

ADD 3.7.8

ADD In making its request, the administration shall furnish the necessary information to enable the Bureau to endeavour to effect such coordination.

ADD *Action to Be Taken by the Bureau*

ADD 3.7.9

ADD When the Bureau receives a request under 3.7.4, it shall forthwith send a telegram to the administration concerned requesting immediate acknowledgement.

ADD 3.7.10

ADD When the Bureau receives an acknowledgement following its action under paragraph 3.7.9, or when the Bureau receives a request under paragraph 3.7.5, it shall forthwith send a telegram to the administration concerned requesting an early decision in the matter.

ADD 3.7.11

ADD When the Bureau receives a request under paragraph 3.7.7, it shall endeavour to effect coordination in accordance with the provisions of paragraph 3.1. When the Bureau receives no acknowledgement to its request for coordination within a period of thirty days, it shall act in accordance with paragraph 3.7.9.

ADD 3.7.12

ADD Where necessary, as part of the procedure under paragraphs 3.7.3 to 3.7.8, the Bureau shall assess the interference. In any case, the Bureau shall inform the administrations concerned of the results obtained.

ADD 3.7.13

ADD The Bureau may request additional information which it may require to assess the interference to the services concerned.

ADD 3.7.14

ADD If an administration fails to reply within thirty days of dispatch of the Bureau's telegram requesting an acknowledgement sent under paragraph 3.7.9, or fails to give a decision in the matter within thirty days of dispatch of the Bureau's telegram of request under paragraph 3.7.10, it shall be deemed that the administration with which coordination was sought has undertaken:

ADD 3.7.15

ADD a) that no complaint will be made in respect of any harmful interference affecting the services rendered by its terrestrial stations or its earth stations with regard to operation in the opposite direction of transmission which may be caused by the use of the assignment for which coordination was requested;

ADD 3.7.16

ADD b) that its terrestrial stations or its earth stations operating in the opposite direction of transmission will not cause harmful interference to the frequency assignment for which coordination was requested.

NOC *Notification of Frequency Assignments in the Event of Continuing Disagreement*

MOD 3.8 In the event of continuing disagreement between an administration seeking coordination and an administration with which coordination has been sought, the administration seeking coordination shall, except in the cases where the assistance of the Bureau has been requested, defer the submission of its notice concerning the proposed assignment by six months from the date of the request for coordination, taking into account the provisions of No. 1496. When the assistance of the Bureau has been requested, the submission of the notice shall be deferred for a further three months.

NOC **Section IV. Coordination of Frequency Assignments to
Terrestrial Stations for Transmission in Relation to Earth Stations
of a Non-Geostationary-Satellite Network**

NOC *Requirement for Coordination*

MOD 4.1 Before an administration notifies to the Bureau, or brings into use any frequency assignment to a terrestrial station for transmission within the coordination area, as specified in Annex 2 to this Resolution, of an earth station of a non-geostationary satellite network, in a band allocated with equal rights to terrestrial radiocommunication services and space radiocommunication services (space-to-Earth), it shall effect coordination of the proposed assignment with the administration responsible for the earth stations with respect to the frequency assignments:

ADD 4.1.1 for which the associated space network characteristics have been communicated to the Bureau under paragraph 1.3, and

MOD 4.1.2 which are in conformity with No. 1503; and

ADD 4.1.3 either coordinated under No. 1107 or paragraph 3.1 above; or

ADD 4.1.4 to be taken into account for coordination with effect from the date of communication of the information referred to in No. 1113 or paragraph 3.2 above; or

ADD 4.1.5 recorded in the Master Register with a favourable finding with respect to No. 1505 or paragraph 5.1.2 below; or

ADD 4.1.6 recorded in the Master Register with an unfavourable finding with respect to No. 1505 or paragraph 5.1.2 below, and a favourable finding with respect to No. 1509 or paragraph 5.1.4 below; or

- ADD** 4.1.7 recorded in the Master Register with an unfavourable finding with respect to No. 1505 or paragraph 5.1.2 below and No. 1509 or paragraph 5.1.4 below, the notifying administration having stated that it accepts the interference resulting from the existing terrestrial stations located within the coordination area of the earth station on the date of its recording.
- ADD** 4.1.8
No coordination under paragraph 4.1 is required when an administration proposes:
- ADD** 4.1.9
a) to bring into use a terrestrial station located outside the coordination area of an earth station;
- ADD** 4.1.10
b) to change the characteristics of an existing assignment in such a way as to remain within the envelope of the characteristics of this assignment.
- ADD** 4.1.11
c) to bring into use a terrestrial station within the coordination area of an earth station, provided that the proposed terrestrial station assignment is outside any part of a frequency band coordinated under paragraph 3.5.1 for reception by that earth station.
- NOC** *Coordination Data*
- NOC** 4.2 For the purpose of effecting coordination, the administration requesting coordination shall send to each administration concerned under paragraph 4.1 all pertinent information. The request for coordination may specify all or some of the frequency assignments expected to be used within the next three years by stations of a terrestrial network wholly or partly within the coordination area of the earth stations. Thereafter each assignment shall be dealt with individually.
- NOC** *Acknowledgement of Receipt of Coordination Data*
- NOC** 4.3 An administration with which coordination is sought under paragraph 4.1 shall immediately acknowledge receipt of the coordination data.
- NOC** *Examination of Coordination Data and Agreement Between Administrations*
- MOD** 4.4 On receipt of the coordination data, the administration with which coordination is sought shall promptly examine the matter with regard to interference which would affect the services rendered by its earth stations covered by paragraphs 4.1 to 4.1.7, which are operating or are to be operated within the next three years.

NOC 4.5 The administration with which coordination is sought shall, within an overall period of four months from dispatch of the coordination data, either notify the administration requesting coordination of its agreement to the proposed assignment or, if this is not possible, indicate the reasons for its objection and make such suggestions as it may be able to offer with a view to a satisfactory solution of the problem.

ADD 4.6

[RR 1168 to 1181] *Requests to the Bureau for Assistance in Effecting Coordination*

ADD 4.6.1

An administration seeking coordination may request the Bureau to endeavour to effect coordination in those cases where:

ADD 4.6.2

a) an administration with which coordination is sought under paragraph 4.1 fails to acknowledge receipt under paragraph 4.3 within thirty days of dispatch of the coordination data referred to in paragraph 4.2; or

ADD 4.6.3

b) an administration has acknowledged receipt under paragraph 4.3, but fails to give a decision within four months of dispatch of the coordination data; or

ADD 4.6.4

c) there is disagreement, as to the acceptable interference, between the administration seeking coordination and an administration with which coordination is sought; or

ADD 4.6.5

d) coordination is not possible for any other reason.

ADD 4.6.6

In making its request, the administration shall furnish the necessary information to enable the Bureau to endeavour to effect such coordination.

ADD 4.7

Action to Be Taken by the Bureau

ADD 4.7.1

When the Bureau receives a request under paragraph 4.6.2, it shall forthwith send a telegram to the administration concerned requesting immediate acknowledgement.

ADD 4.7.2

When the Bureau receives an acknowledgement following its action under paragraph 4.7.1, or where the Bureau receives a request under paragraph 4.6.3, it shall forthwith send a telegram to the administration concerned requesting an early decision in the matter.

ADD 4.7.3

When the Bureau receives a request under paragraph 4.6.5, it shall endeavour to effect coordination in accordance with the provisions of paragraph 4.1. When the Bureau receives no acknowledgement of its request for coordination within three months, it shall act in accordance with paragraph 4.6.7.

ADD 4.7.4

Where necessary, as part of the procedure under paragraphs 4.6.1 to 4.6.5, the Bureau shall assess the interference. In any case, the Bureau shall inform the administrations concerned of the results obtained.

ADD 4.7.5

The Bureau may request additional information which it may require to assess the interference to the services concerned.

ADD 4.7.6

If an administration fails to reply within thirty days of dispatch of the Bureau's telegram sent under paragraph 4.7.1 requesting an acknowledgement, or fails to give a decision in the matter within thirty days of dispatch of the Bureau's telegram of request sent under 4.7.2, it shall be deemed that the administration with which coordination was sought has undertaken that no complaint will be made in respect of any harmful interference which may be caused by the terrestrial station being coordinated to the service rendered by its earth station.

NOC *Notification of Frequency Assignments in the Event of Continuing Disagreement*

MOD 4.8 In the event of continuing disagreement between an administration seeking coordination and an administration with which coordination has been sought, the administration seeking coordination shall, except in the cases where the assistance of the Bureau has been requested, defer the submission of its notice concerning the proposed assignment by six months from the date of the request for coordination, taking into account the provisions of Nos. 1230 and 1496. When the assistance of the Bureau has been requested, the submission of the notice shall be deferred for a further three months.

NOC

Section V. Notification of Frequency Assignments

NOC

Notification of Assignments to Space Stations and Earth Stations

MOD

5.1 An administration shall, for the purpose of notifying an assignment to the Bureau, apply the provisions of Article 13. When applying the provisions of Article 13 to frequency assignment notices relating to space stations and earth stations covered by this Resolution, the Bureau shall:

MOD

5.1.1 in applying No. 1504, also examine the notice with respect to its conformity with the provisions of paragraphs 2.1, 2.2 and 2.5.8 relating to coordination of the use of the frequency assignment with the other administrations concerned;

MOD

5.1.2 in applying No. 1505, also examine the notice with respect to its conformity with the provisions of paragraphs 3.1 and 3.1.1 to 3.1.3 relating to coordination of the use of the frequency assignment with the other administrations concerned;

NOC

5.1.3 in applying No. 1506, also examine the notice with respect to the probability of harmful interference when the coordination under paragraph 2.1 or 2.2 has not been successfully effected;

NOC

5.1.4 in applying No. 1509, also examine the notice with respect to the probability of harmful interference when the coordination under paragraph 3.1 has not been successfully effected;

(MOD)

5.1.5 not apply Nos. 1515 and 1516;

ADD

5.1.6 apply No. 1550 with respect to the date of publication of the special section of the weekly circular referred to in paragraph 1.3.

NOC

5.2 The examination under paragraph 5.1.3 or 5.1.4 shall take into account the frequency assignments for transmission or reception already recorded in the Master Register.

NOC

Notification of Assignments to Terrestrial Stations

MOD

5.3 An administration shall, for the purpose of notifying an assignment to the Bureau, apply the provisions of Article 12. When applying the provisions of Article 12 the Bureau shall, in application of No. 1353, examine frequency assignment notices relating to terrestrial stations covered by this Resolution with respect to their conformity with the provisions of paragraph 4.1 relating to coordination of the use of the frequency assignment with the other administrations concerned.

ANNEX 2 TO RESOLUTION 46

A2.1 Coordination thresholds for sharing between MSS (space-to-Earth) and terrestrial services in the same frequency bands and between non-GSO MSS feeder links (space-to-Earth) and terrestrial services in the same frequency bands

A2.1.1 Below 1 GHz

In the bands 137 - 138 MHz and 400.15 - 401 MHz, coordination of a space station of the MSS (space-to-Earth) with respect to terrestrial services is required only if the power flux-density produced by the station exceeds -125 dB(W/m²/4 kHz) at the Earth's surface.

A2.1.2 Between 1 and 3 GHz

A2.1.2.1 Objectives

Generally, power flux-density thresholds were used to determine the need for coordination between space stations of the MSS (space-to-Earth) and terrestrial services. However, to facilitate sharing between digital fixed service (FS) stations and NGSO MSS space stations, the concept of fractional degradation in performance (FDP) was adopted. This concept involves new methods described in this Annex.

As a consequence of this new concept, the need for coordination between space stations of the MSS (space-to-Earth) and terrestrial services is determined using two methods:

- simple method: FDP (**simple** definition of the MSS system and characteristics of **reference** FS stations are used in inputs) or power flux-density trigger value;
- more detailed method: system specific methodology (SSM) (**specific** characteristics of the MSS system and characteristics of **reference** FS stations are used in inputs) as described, for example, in Annex 1 to Recommendation ITU-R IS.1143.

If one of the two methods gives a result that does not exceed the criteria relevant to each method, there is no need for coordination.

If only one method is available in an administration, the result of this method must be taken into account.

A2.1.2.2 General considerations

A2.1.2.2.1 Method for calculating the value of fractional degradation in performance (FDP)

The FDP is used in cases of sharing between digital FS stations with non-GSO MSS stations (space-to-Earth).

To calculate the value of the FDP, the following parameters are needed:

- technical characteristics of digital FS station;
- technical characteristics of non-GSO MSS constellation.

The FDP is calculated:

- by simulating the proposed MSS constellation using the information given in paragraph A.3 of Resolution 46;
- by positioning the FS station at a certain latitude (each station is assumed to operate at an elevation angle of 0°);
- by calculating for each pointing azimuth (Az) varying between 0° and 360°:
 - at each instant in time of the simulation, the aggregate interference from all visible space stations received at the FS station;
 - the FDP_{Az} for the azimuth Az, using the following formula:

$$FDP_{Az} = \frac{\max \sum \frac{I_i f_i}{I_i = \min N_T}}$$

- by the following formula:

$$FDP = \max(FDP_{Az})$$

(The formula for FDP applies to the 1 - 3 GHz frequency range only. A different formula may apply at frequencies above 3 GHz.)

where:

- I_i = interference noise power level (W)
- f_i = the fractional period of time during which the interference power equals I_i
- N_T = station receiving system noise power level = kTB (W)
- k = Boltzmann's constant = $1.38 \cdot 10^{-23}$ (J/K)
- T = FS station receiving system effective noise temperature (T should be calculated by the following formula: $10 \log T = NF + 10 \log T_0$ where NF (dB) is the receiver noise figure given in Annex 1 and T_0 should be assumed as 290 K)
- B = reference bandwidth = 1 MHz

NOTE – For the purpose of FDP calculation according to this Annex, it should be assumed that all space stations in the same MSS constellation operate on the same frequencies.